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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/332,103	06/14/1999	KENTARO YANO	8622868	2516

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EXAMINER	
LAROSE, COLIN M	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/332,103	YANO ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Arguments and Amendments

1. Applicants' amendments and arguments filed 5 July 2005, have been entered and made of record.

Response to Amendments and Arguments

2. Applicant has amended claims 1, 2, and 7 to denote that the image data is quantized to single dots rather than pixels. This amendment overcomes the previous rejection utilizing Shimada, however, U.S. Patent 4,680,645 by Dispoto et al. is relied upon below to cure the deficiencies of Shimada.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,795,082 by Shimada et al. ("Shimada") in view of U.S. Patent 4,680,645 by Dispoto et al. ("Dispoto").

Regarding claim 1, Shimada discloses a quantization method (figure 12) in which quantization processing is applied to data for first and second recording means (figure 5, C1 and

C2: low- and high-density cyan) which record input image data in a plurality of gradations which belong to each of different gradations in substantially the same hue, comprising the steps of:

inputting multi-value level image data (S100, figure 12);

a first quantization step (S140, figure 12) of performing quantization of the image data input for the first recording means to data with 3 or more levels which are lower than that of the input image data, the first quantization step performing the quantization by conducting error correction (column 13, lines 56-67 and figure 17: quantizing the image data into low density dots is done by error diffusion); and

a second quantization step (S120, figure 12) of performing quantization of the image data input for the second recording means to data with 3 or more levels which are lower than that of the input image data, the first quantization step performing the quantization without conducting error correction (column 12, lines 40-47 and figure 15: quantizing the image data into high density dots is done by dithering),

wherein at least one of the first and second quantization steps performs quantization of the input image data of one dot to multi-value data with 2 levels, so that the corresponding one of the first and second recording means may record the image in a plurality of gradations (both quantization steps quantize the image data of one dot into one of two levels – as shown figure 18, the input image data is quantized into a matrix of dots, wherein each dot is represented in one of two levels: either applied or not applied),

wherein in the first and second quantization steps, one dot of the image data is quantized so as to be able to record one dot with three levels and upon recording with a predetermined level of the three levels, both of the first recording means and the second recording means are used

(i.e. the first and second recording means combine to form a dot in one of three levels: no dot, light dot, or dark dot), and

wherein the first recording means records the image with lower density recording material than that used by the second recording means (i.e. first recording means uses light dots, and second recording means uses dark dots).

However, Shimada does not disclose at least one of the first and second quantization steps performs quantization of the input image of one dot to multi-value data with 3 or more levels, or that one dot of the image data is quantized so as to be able to record one dot with 5 or more levels, as claimed.

Dispoto discloses a system for rendering image data with variable size dots. In particular, Dispoto discloses the concept of applying an error diffusion technique to determine dot sizes rather than dot placement, as was conventionally done (see column 2, lines 24-28). In particular, Dispoto utilizes a table (i.e. figure 1) that correlates density values to dot sizes. A first pixel is assigned a corresponding dot size from the density table; then the error between the actual density of the pixel and the density from the table is computed and propagated to adjacent pixels to determine their respective dot sizes. See column 4, lines 12-63. Thus, Dispoto effectively quantizes input image data of a single dot to one of a plurality of sizes. The table in figure 1 utilizes an arbitrary number of quantized sizes greater than three. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shimada by Dispoto to perform the first quantization of Shimada's low density dots by Dispoto's error diffusion method, which results in the quantization of image data to one of at least three sizes based on

propagated error values, since Dispoto discloses that an error diffusion technique that determines dot sizes rather than dot placement achieve several advantages, mostly notably enhanced quality of printed images (see column 2, lines 24-52). As a result of the first quantization step performing quantization of the input image of one dot to multi-level data with 3 or more levels, the first and second quantization steps would combine to record one dot with five or more levels (i.e. one of at least three sizes for a light density dot, a high density dot, or no dot).

Shimada also discloses the corresponding apparatus and storage medium of claims 2 and 7, which are substantially the same in scope as claim 1, which claims are obvious over Shimada in view of Dispoto for the same reasons as explained above for claim 1.

Regarding claim 3, Shimada discloses the recording means are of an ink-jet system (e.g. figure 4).

Regarding claim 4, Shimada discloses the first and second recoding means record the image with light and black (i.e. dark) ink ("C1" and "C2" in figure 5).

Regarding claim 5, Shimada discloses the size of the ink drop is controlled when the first and second recording means effect recording in a plurality of gradations (i.e. Shimada's recording means controls the size of the high- and low-density ink drops so that the drops are uniform as shown in figure 18 and variable according to Dispoto's teachings).

Regarding claim 6, Shimada discloses the first and second recording means share a region in which both means effect recording while both raising recording levels (e.g. figure 18).

Regarding claims 8-10, Shimada discloses the first quantization uses error diffusion, and the second quantization uses dithering, as addressed above for claim 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Jingge Wu, can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VIKKRAM BALI
PRIMARY EXAMINER

CML
Group Art Unit 2623
30 September 2005